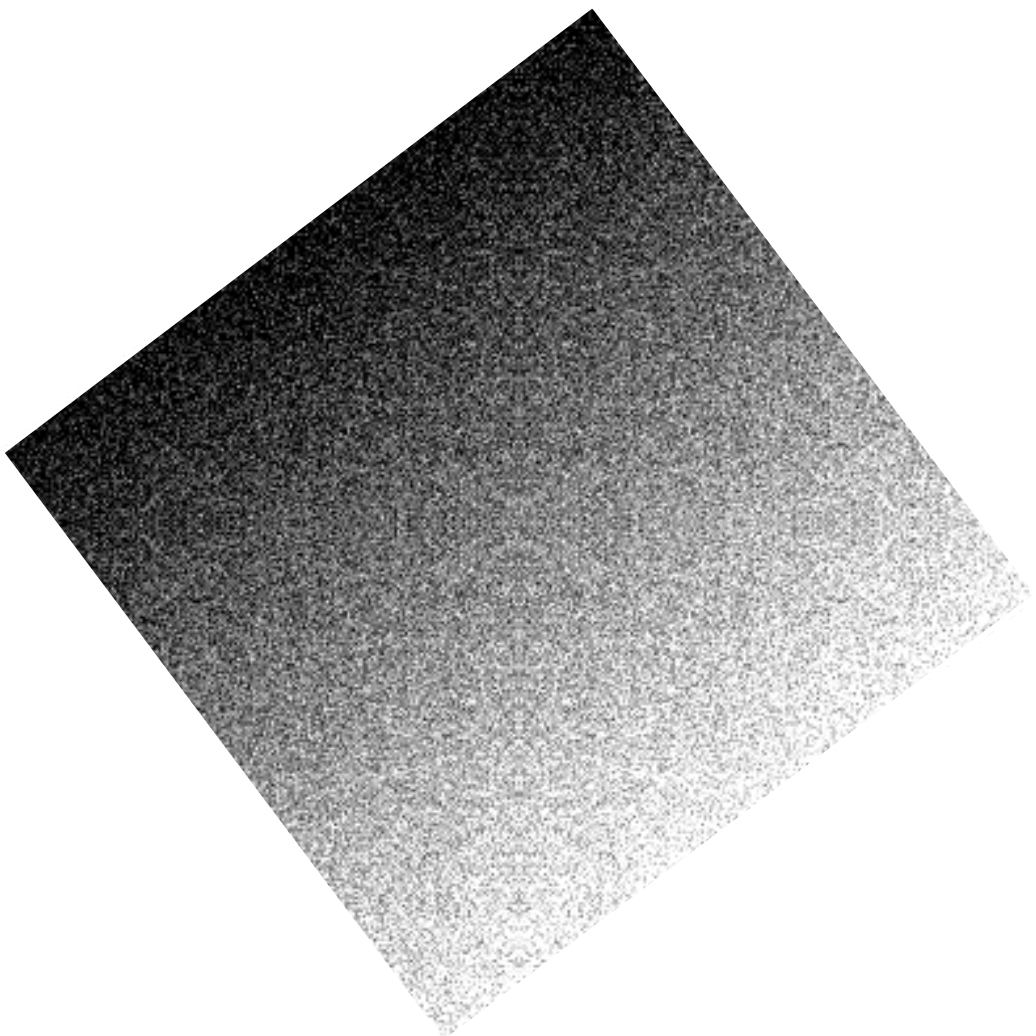
Intelligent Decision Server

IBM

Installing Database Gateway Services for UNIX Environments

Version 1



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Note

Before using this information and the product it supports, be sure to read the general information under “Notices” on page v.

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This edition applies to Version 1 of Intelligent Decision Server, 5639–IDS, and to any subsequent releases until otherwise indicated in new editions or technical newsletters. Make sure you are using the correct edition for the level of the product.

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DB2 for OS/2	Operating System/400	System/370
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About This Book

This book describes how to install the database gateway services, that provide IDS users access to these databases:

DataJoiner

DB2 for AIX

SYBASE

ORACLE

Red Brick Warehouse

Who Should Read This Book

This book is intended for the person installing the database gateway services.

To perform the installation procedures, you should have knowledge of:

IBM RISC System/6000, HP 9000 Series 800, or Sun SPARCstation installation and configuration

AIX, HP-UX, or Solaris system administration

DB2 for AIX, SYBASE SQL Server, ORACLE server, or Red Brick Warehouse server administration

IDS system and database administration

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Your feedback is important to us in providing you with the most accurate and high-quality information. If you have any comments about this book or any other IDS documentation, please visit our Website at:

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Chapter 1. Introducing the UNIX Database Gateway Services

To help you retrieve data from a variety of sources, the IBM Intelligent Decision Server (IDS) supports several simple, uniform interfaces to several relational database management systems (RDBMSs). These include:

DB2 for AIX

SYBASE SQL Server**

ORACLE** server

Red Brick Warehouse** server

This chapter provides a brief introduction to the database gateway services.

The remainder of this book contains detailed instructions for preparing, installing, and upgrading the database gateway services. Some UNIX configuration tasks and troubleshooting information are also provided.

The UNIX Database Gateway Services

The IDS database gateway services for UNIX environments enable IDS desktop tool users to connect to gateways that communicate with RDBMS servers. The IDS tools and gateways provide full access to all of the distributed database features of the supported RDBMS vendors. This way, you can have a variety of configurations, provided that the connections between the IDS desktop and the gateway use TCP/IP, which is supported by a local area network (LAN) connection, or by internetwork routing. For example, you can install:

The gateway and the RDBMS server on one workstation.

The gateway and the RDBMS server on separate workstations.

The gateway and one RDBMS server on one workstation, and connect to another RDBMS server on another workstation.

When the RDBMS server and the gateway are installed on separate workstations, the connection can be any protocol, such as TCP/IP, and any network type (such as Ethernet or token ring) supported by the RDBMS vendor.

The database gateway services software can run only on certain workstations that are directly connected to the IDS LAN. These workstations are:

A RISC System/6000 workstation running AIX version 3.2 or later.

An HP 9000 Series 800 workstation running HP-UX, version 9 or later.

A SPARCstation workstation running Solaris, version 5.3 or later.

Multiple database gateway services can be installed on a single network node, but must be associated with a network adapter card. You install the software for a particular type of operating system (such as AIX, HP-UX, or Solaris) only once per node. After the

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software is installed, you can configure those services to access the supported databases.

The database gateway services for UNIX environments and the databases they support are:

AIX Database Gateway Services

- DB2 for AIX
- DataJoiner
- SYBASE
- ORACLE
- Red Brick Warehouse

HP-UX Database Gateway Services

- SYBASE
- ORACLE
- Red Brick Warehouse

Solaris Database Gateway Services

- SYBASE
- ORACLE

A service can support many gateways, and each gateway can support multiple *sessions*. Sessions establish communication paths to the SYBASE, ORACLE, Red Brick Warehouse, or DB2 for AIX databases.

An IDS end user does not directly connect to the RDBMS server. Instead, the user connects to a gateway, which then establishes a communications path with the RDBMS server.

The gateway assigns sessions individually for use by the following IDS data access tools:

Query
Reporter
DBA
SQL Entry
Forms Design
SQL Input
Browser

You can configure your data access tools so that they can connect to any configured database gateways. To do this, specify the gateway and database name in the **Database Name** field within the tool's icon option sheet. For details, see *Administering Databases with IDS*.

Running Multiple Services on a Workstation

The database gateway services are sold with a specific number of sessions that can connect to a database from a gateway running on a particular operating system.

For example, one of the database gateway services assets sold by IBM is:

AIX–SYBASE Database Gateway Service – 8 sessions

This asset allows you to concurrently use eight SYBASE sessions on a RISC System/6000 workstation that is running the AIX operating system. After you install the software on your workstation (which forms an IDS node), you can allocate those eight sessions to the services that you have defined on that node.

Accessing Different Databases

If you have access to several databases of different types, you can purchase additional sessions, which also run on the AIX operating system, to access those databases. Some of these sessions include:

AIX–ORACLE Database Gateway Service – 8 sessions

AIX–Red Brick Database Gateway Service – 8 sessions

AIX–DB2 for AIX Database Gateway Service – 8 sessions

After you obtain rights to the additional sessions, you configure your new assets with the IDS Asset Manager in the SA Tool. Then, you assign the new sessions to a service on an appropriate node on your LAN. Finally, you allocate those sessions to the gateways running on that service.

Installing More Than One Node

You can also install more than one node on the same workstation. This configuration might come in handy when you have different versions of the database gateway services.

To install more than one service, you must:

- Assign a different value to the M4GW_OFFSET environment variable for each database gateway service (the default value for the first service is 47).
- Assign a unique user ID to each database gateway service.
- Install each node on a different network adapter within the workstation.

For a TCP/IP LAN, the node address is the IP address of the adapter. Figure 1 on page 4 shows a UNIX system with more than one adapter, where each adapter is configured as a node in a TCP/IP IDS LAN. In this example, there are two unique nodes.

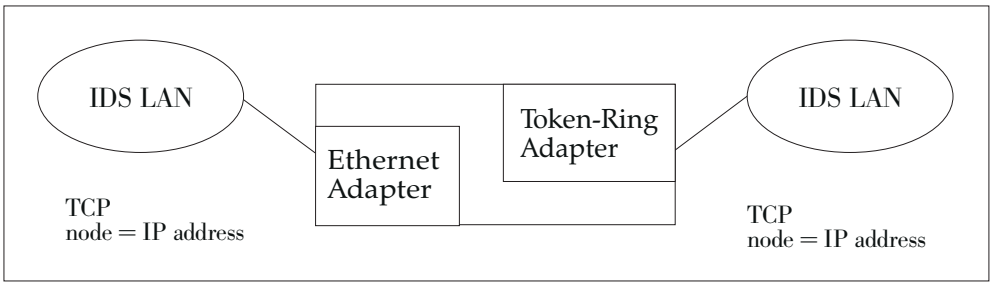

Figure 1. A UNIX system with more than one adapter

A node is capable of supporting multiple services. You use the **startgateway** command to start the gateway services. There can be only one **startgateway** command per adapter per protocol (or one startgateway command per node). Each service can be configured for multiple gateways accessing different types of RDBMSs. Each gateway and service must have a unique name. For example, *S1GW1* can be configured as a SYBASE gateway, *S1GW2* can be configured as an Oracle gateway, and so on.

All gateways are allowed multiple sessions, and each can access different RDBMSs.

Chapter 2. Installing a Service on a RISC System/6000 Workstation

The IDS database gateway services for UNIX environments can run on a RISC System/6000 workstation connected to an IDS Ethernet or token-ring LAN.

This chapter provides the software requirements, the installation instructions, and the upgrade instructions to run the database gateway services on a RISC System/6000 workstation.

Hardware and Software Requirements

This section identifies the hardware and software requirements for running the IDS database gateway services on a RISC System/6000 workstation. See the README file on the IDS UNIX Database Gateway CD-ROM for the latest information about supported versions.

Hardware

The hardware requirements to run gateways with a RISC/6000 workstation for a UNIX environment are:

A minimum of 32 MB of internal memory.

A minimum of 12 MB free disk space for a user's home directory on the UNIX-based workstation, independent of the space needed for the RDBMS server.

A token-ring or Ethernet network adapter.

A CD-ROM drive.

Software

To perform this installation, you must have:

IDS version 1.0.

AIX operating system, version 3.2. or later

One or more of the following servers:

- SYBASE SQL Server, versions 4.x or 10.0x.
- Red Brick Warehouse server, version 2 or later.

  If you plan to connect to a Red Brick Warehouse server, you must also install the Red Brick Open Server Gateway, version 2 or later, on the workstation that contains the Red Brick server.
- ORACLE server for AIX.

  If you plan to install the ORACLE server and the database gateway service on separate workstations, you must have the Oracle SQL*Net product on the ORACLE server. Although SQL*Net is linked in the IDS database gateway services, you must obtain the right to use it before you can use the service.

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- DB2 for AIX server, which consists of:
  - DB2 Client Support for AIX
  - DB2 Client Application Enabler for AIX
  - Distributed Database Connection Services for AIX
- DataJoiner Server

Determining Network Adapter Type

To successfully run the installation script, you must determine the type of IDS network (such as Ethernet or token ring). To determine the network adapter type, enter at the command line:

```
/usr/sbin/lscfg
```

The system returns a list of adapters:

```
+ent
 - 3 n/a
+tok    - 4 n/a
+tok1   - 5 n/a
```

(In this example, the output is from a workstation running on a token-ring adapter.)

To see more information about the adapter *tok0*, particularly its address, type:

```
/usr/sbin/lscfg -l tok  -v
```

The system returns:

```
DEVICE       LOCATION     DESCRIPTION

tok    - 4           n/a


      Network  Address.....1   5A4F4675

       Displayable Message.....TOKEN RING
      EC  Level.....A78976

      FRU  Number..... 22F938
      Manufacturer.....VEN 8 9375

      Part  Number..... 74F4134
      Serial
      Number..... 13942
       ROS Level and ID.....

     Loadable Microcode Level.....
```

Installing the Gateway Service

In general, installation consists of two parts:

Creating the gateway service user account

Loading software from the IDS UNIX Database Gateway CD-ROM

These tasks are performed on a RISC System/6000 workstation.

The user ID *idsgw* and home directory */u/idsgw* are used in the examples here.

Creating the Gateway Service User Account

You can create user accounts for any user ID and home directory. Any user ID you create must be used exclusively for its database gateway service.

To create a database gateway service user account on a RISC System/6000 workstation:

1. Log on as root.
2. To verify the amount of free space in the */u* file system, enter:

   ```
   df /u
   ```

   User accounts require a minimum of 12 MB free disk space in the home directory.
3. Set the maximum number of processes per user ID to 200 by entering:

   ```
   chdev -l sys  -a maxuproc=2
   ```

   (The character after the first hyphen is the letter **L**.)
4. Use the System Management Interface Tool (SMIT) to create a gateway service user account, home directory, and password by entering:

   ```
   smit mkuser
   ```

   Do not define a gateway user's home directory under any other gateway user's home directory.

   See the *RISC System/6000 Reference* for detailed information about creating a user account and password.
5. Ensure that the PATH= statement in the gateway user's .profile file includes access to the current directory (**.**), the */usr/ucb* directory, and the */usr/bin* directory.

   For example, your PATH= statement might look like this:

   ```
   PATH=/etc:/usr/etc:/bin;/usr/bin:/usr/ucb:
   ```
6. Log off.

Loading the Software

To install the database gateway service on a RISC System/6000 workstation:

1. Insert the CD-ROM into the CD-ROM drive.
   a. Ensure that the CD-ROM is mounted.

b. If it is not mounted:

   1) Log on as root.

   2) Enter:

      mount -rv cdrfs /dev/cd <CD-Rom directory>

      where /dev/cd0 is the name of the CD-ROM device.

   3) Log off.

2. Log on to the workstation as the gateway service user (*idsgw*, in these examples).

3. Load the gateway service software by executing the installation script. Enter:

   <CD-Rom directory>/aix/instids

   The installation script creates a subdirectory named *bin* into which it loads the gateway software.

   As the system reads the files into the bin directory, it displays a series of messages that list the number of bytes and media blocks for each of the files being loaded.

4. Press Enter when the system directs you to.

5. If the gateway service is attached to **en0**, press Enter. If not, type the correct network device interface name and press Enter.

6. Press Enter to accept the default realm number (1) or enter a different realm number and press Enter.

7. If this is the only database gateway service installed in this RISC System/6000 workstation, accept the default UNIX IPC shared memory key offset (47) by pressing Enter.

   If you plan to install more than one database gateway service on the workstation, type a different offset number between 1 and 99 for each subsequent gateway service. Key offsets must be unique among multiple active gateway services.

   After you accept the default or enter the offset number, the system will ask if this is a routable gateway.

8. Enter **n** if this is not a routable gateway.

   The system then creates the **startgateway** command. Skip step 9 and continue with the procedure. For more information about the instids script, see the paragraphs following step 9.

   Enter **y** if this is a routable gateway.

   The system then prompts you for the IP addresses of the Asset Manager and the Directory Service.

9. Press Enter to accept the defaults. Otherwise, enter the IP addresses and press Enter.

   The system then creates the **startgateway** command.

The instids script assigns the values you specified in the installation script to the environment variables in the **startgateway** command (such as the network type and the realm number).

Environment variables are automatically set during the installation process, based on information you supply. See Appendix A, “IDS Environmental Variables” on page 31 for a list of environmental variables.

10. After the install script finishes loading the files, verify that they are in the bin directory by entering:

    ```
    cd bin (if not already in the bin directory)
    ls
    ```

    You should see:

    ```
    M4CALIST
    M4CAMAIN
    M4CARECV
    M4CASEND
    M4CONSOLE
    M4CORE
    M4DB2
    M4DBGW
    M4DBORA
    M4DBSERV
    M4DBSESS
    M4DSP
    M4S411
    M4S411SVR
    M4SPPREX
    4startup
    README
    SQLMACRO
    abortgateway
    rmipc
    showgateway
    startgateway
    stopgateway
    ```

    If any of these files are missing, contact the IBM Support Center.

11. Change the ownership and mode of the M4S411SVR file after obtaining permission from your system administrator. To change the ownership and mode of the M4S411SVR file, enter:

    ```
    cd bin (if not already in the bin directory)
    su
    password: (enter the root password)
    chown root M4S411SVR
    chmod 4711 M4S411SVR
    exit
    ```

12. When you complete the installation, remove the CD-ROM from the CD-ROM drive.

13. If you have a token-ring connection, verify that the workstation's setting for the ring speed of the device specified as your network adapter matches the actual speed of your token-ring adapter. If it does not match, change it as necessary.

    To check the ring speed while logged in as the root user, enter:

    smit chgtok

14. Follow the instructions for the **smit chgtok** command.
15. Configure the node and assign it a database gateway service using the Asset Management interface within the SA Tool. These tasks are described in detail in the *Configuring and Administering Database Gateway Services*.
16. Start the service by entering:

    cd bin (if not already in the bin directory)

    ./startgateway

    For detailed information on administration of the UNIX Interface, see Chapter 5, “Performing Configuration and Administration Tasks” on page 27.
17. After the service has started, you must configure and administer the gateway using the Database Gateway Service interface within the SA tool. These tasks are described in detail in *Configuring and Administering Database Gateway Services*.

Upgrading the Gateway Service

To upgrade the gateway service, load the new version of software from the IDS UNIX Database Gateway CD-ROM:

1. Insert the CD-Rom.
   a. Ensure that the CD-Rom is mounted.
   b. If it is not mounted:
      1) Log on as root.
      2) Enter:

         -mount -rv cdrfs /dev/cd <CD-Rom directory>

      3) Log off.
2. Log on to the workstation as the gateway service user (*idsgw*, in this example)
3. Stop the gateway service by entering:

   cd bin (if not already in the bin directory)

   .
   /abortgateway

4. If you plan to build the **startgateway** command only, go to step 6.

5. If you plan to install from a gateway from the CD-ROM, first delete the M4S411VR file. Obtain permission from your system administrator before doing this. To delete the M4S411VR file, enter:

   % cd bin (if not already in the bin directory)
   % su
   % password: (enter the root password)
   % rm M4S411SVR
   % exit

6. Change the directory to the home directory, then enter:

   tar -xvf /dev/rfd instids

7. Load the gateway software by executing the installation script. Enter:

   <CD-Rom directory>/aix/instids

   The installation script detects whether a subdirectory named *bin* exists and whether gateway software has been loaded from a previous release. It then prompts you with four options:

   1. Install the media only.

   2. Build the startgateway command only.

   3. Install the media and build the startgateway command.

   x. Exit the install script.

   Option 1 (Install the media only.) enables you to install the gateway services and overwrite the existing files. You will not be asked for information to build the **startgateway** command.

   Follow the directions in step 4 of “Loading the Software” on page 7 for installing the media. Verify that the files were loaded correctly by following step 10 of “Loading the Software” on page 7, then proceed with steps 11 through 16 to set permissions and start the service.

   Option 2 (Build the startgateway command only.) prompts you for information that is used to build the startgateway command.

   To build the **startgateway** command, follow the directions in steps 4 through 9 of “Loading the Software” on page 7. In step 9, the existing **startgateway** command appears and you are asked if you want to replace it with the new one. Continue with steps 15 through 17 to start the service.

   Option 3 (Install the media and build the startgateway command.) enables you to perform the functions of both options 1 and 2.

   Follow the directions in “Loading the Software” on page 7. In step 9, the existing **startgateway** command appears and you are asked if you want to replace it with the new one.

8. Remove the CD-ROM from the CD-ROM drive.

To configure and administer the database gateway services using the asset management and database gateway interfaces, see *Configuring and Administering Database*

Gateway Services. For other system and database administration tasks, see the *System Administration Guide and Reference* and *Administering Databases with IDS*.

When your installation is complete, go to Chapter 5, “Performing Configuration and Administration Tasks” on page 27, for the procedures that explain how to configure a database gateway service from a UNIX-based workstation.

Chapter 3. Installing a Service on an HP 9000 Workstation

The IDS database gateway services for UNIX environments can run on an HP 9000 Series 800 workstation connected to an IDS Ethernet or token-ring LAN.

This chapter provides the software requirements, the installation instructions, and the upgrade instructions to run the database gateway services on an HP 9000 Series 800 workstation.

Hardware and Software Requirements

This section identifies the hardware and software requirements for running the IDS database gateway services on an HP 9000 workstation. See the README file on the IDS UNIX Database Gateway CD-ROM for the latest information about supported versions.

Hardware

The hardware requirements to run gateways with an HP 9000 Series 800 workstation for a UNIX environment are:

A minimum of 32 MB of internal memory on your workstation.

A minimum of 12 MB free disk space for the user's home directory on the UNIX-based workstation, independent of the space needed for the RDBMS server.

A token-ring or Ethernet network adapter.

A CD-ROM drive.

Software

To perform this installation, you must have:

IDS version 1

HP-UX operating system, version 9.0.x

HP-UX token-ring drivers (if appropriate)

One or more of the following servers:

- SYBASE SQL Server, version 4.x or 10.1.x.
- Red Brick Warehouse server, version 2 or later.

  If you plan to connect to a Red Brick Warehouse server, you must also install the Red Brick Open Server Gateway, version 2 or later, on the workstation that contains the Red Brick server.
- ORACLE server software for HP-UX, version 6 or 7.

  If you plan to install the ORACLE server and the database gateway service on separate workstations, you must have the Oracle SQL*Net product on the ORACLE server. Although SQL*Net is linked in the IDS database gateway services, you must obtain the right to use it before you can use the service.

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Installing the Gateway Service

In general, installation consists of two parts:

Creating the gateway service user account

Loading software from the IDS UNIX Database Gateway CD-ROM.

These tasks are performed on an HP 9000 Series 800 workstation.

The user ID *idsgw* and home directory */u/idsgw* are used in the examples here.

Creating the Gateway Service User Account

You can create user accounts for any user ID and home directory. This user ID is to be used exclusively for the database gateway service.

To create a database gateway service user account on an HP 9000 Series 800 workstation:

1. Log on as root.
2. Verify the amount of free space in the */u* file system by entering:

   df /u

   The df command displays the number of free 512-byte blocks.

   User accounts require a minimum of 12 MB free disk space in the home directory.
3. Use SAM to create a gateway service user account and home directory.

   Do not define a gateway user's home directory under any other gateway user's home directory.
4. Ensure that the PATH= statement in gateway user's profile file includes access to the current directory (.) and the */usr/bin* directory.

   For example, your PATH= statement might look like this:

   PATH=/etc:/usr/etc:/bin;/usr/bin:.

   This allows you to use certain commands, such as *whoami*, *uname*, and *ps*.
5. Log off.

Loading the Software

To install the database gateway service on an HP 9000 Series 800 workstation:

1. Insert the CD-ROM into the CD-ROM drive.
   a. Ensure that the CD-ROM is mounted.
   b. If it is not mounted:
      1) Log on as root.
      2) Enter:

         mount <cdrom device> <cdrom directory>

3) Log off.

2. Log on to the workstation as the gateway service user (*idsgw*, in these examples).
3. Load the gateway service software by executing the installation script. Enter:

   <cdrom directory>/HP-UX/instids

   Some later releases of HP-UX may support lowercase CD-ROM access commands. In that case, enter:

   <cdrom directory>/hp-ux/instids

   The installation script creates a subdirectory named *bin* into which it loads the gateway software.

   As the system reads the files into the bin directory, it displays a series of messages that list the number of bytes and media blocks for each of the files being loaded.
4. Press Enter when the system prompts you to.
5. Press Enter if the gateway service is attached to **lan0**, or type the correct network device interface name and press Enter.
6. Press Enter to accept the default realm number (1) or enter a different realm number and press Enter.
7. If this is the only database gateway service installed in this HP 9000 workstation, accept the default UNIX IPC shared memory key offset (47) by pressing Enter.

   If you plan to install more than one database gateway service on the workstation, type a different offset number between 1 and 99 for each subsequent gateway service. Key offsets must be unique among multiple active gateway services.

   After you accept the default or enter the offset number, the system asks if this is a routable gateway.
8. Enter **n** if this is not a routable gateway.

   The system then creates the **startgateway** command. Go to step 10 and continue with the procedure. For more information about the instids script, see the paragraphs following step 9.

   Enter **y** if this is a routable gateway.

   The system then prompts you for the IP addresses of the Asset Manager and the Directory Service.
9. Press Enter to accept the defaults. Otherwise, type the IP addresses and press Enter.

   The instids script assigns the values you specified in the installation script (such as the network type and the realm number) to the environment variables in the **startgateway** command.

   Environment variables are automatically set during the installation process, based on information you supply. See Appendix A, “IDS Environmental Variables” on page 31 for a list of environmental variables.

10. When the install script finishes loading the files, verify that they are in the bin directory by entering:

    cd bin (if not already in the bin directory)
    ls

    You should see:

    M4CALIST
    M4CAMAIN
    M4CARECV
    M4CASEND
    M4CONSOLE
    M4CORE
    M4DBGW
    M4DBORA
    M4DBSERV
    M4DBSESS
    M4DSP
    M4S411
    M4S411SVR
    M4SPPREX
    M4XNS
    M4startup
    README
    abortgateway
    rmipc
    showgateway
    startgateway
    stopgateway

    If any of these files are missing, contact the IBM Support Center.

11. Remove the CD-ROM from the CD-ROM drive.

12. Change the ownership and mode of the M4S411SVR file after obtaining permission from your system administrator. To change the ownership and mode of the M4S411VR file, enter:

    % cd bin (if not already in the bin directory)
    % su
    % password: (enter the root password)
    % chown root M4S411SVR
    % chmod 4711 M4S411SVR
    % exit

13. Configure the node and assign it a Database Gateway Service using the Asset Management interface within the SA Tool. These tasks are described in detail in *Configuring and Administering Database Gateway Services*.

14. Now you can start the service by typing:

    cd bin (if not already in the bin directory)
    ./startgateway

    For detailed information on administration on the UNIX interface, see Chapter 5, “Performing Configuration and Administration Tasks” on page 27.

15. After the service has started, configure and administer the gateway using the Database Gateway Service interface within the SA tool. These tasks are described in detail in *Configuring and Administering Database Gateway Services*.

Upgrading the Gateway Service

To upgrade the gateway service, load the new version of software from the IDS UNIX Database Gateway CD-ROM:

1. Insert the CD-ROM into the CD-ROM drive.
   a. Ensure that the CD-ROM is mounted.
   b. If it is not mounted:
      1) Log on as root.
      2) Enter:

         mount <cdrom device> <cdrom directory>

      3) Log off.
2. Log on to the workstation as the gateway service user (*idsgw*, in this example) and stop the gateway service:

   cd bin (if not already in the bin directory)
   ./abortgateway

3. If you plan to build a **startgateway** command only, go to step 5.
4. If you are going to install a gateway from the CD-ROM, first remove the M4S411VR file. Obtain permission from your system administrator before doing this.

   To remove the M4S411VR file, enter:

   % cd bin (if not already in the bin directory)
   % su
   % password: (enter the root password)
   % rm M4S411SVR
   % exit

5. Change the directory to the home directory (*u/idsgw*).
6. Load the gateway software by executing the installation script. Enter:

   <cdrom directory>/HP-UX/instids

   Some later releases of HP-UX may support lowercase CD-ROM access commands. In that case, enter:

   <cdrom directory>/hp-ux/instids

   The installation script detects whether a subdirectory named *bin* already exists and whether gateway software has already been loaded from a previous release. It then prompts you with four options:

   1. Install the media only.

2. Build the startgateway command only.

3. Install the media and build the startgateway command.

x. Exit the install script.

Option 1 (Install the media only.) enables you to install the gateway services and overwrite the existing files. You will not be asked for information to build the **startgateway** command.

Verify that the files were loaded correctly by following step 10 in "Loading the Software" on page 14, then proceed with steps 16 through 20 to set permissions and start the service.

Option 2 (Build the startgateway command only.) prompts you for information that is used to build the **startgateway** command.

Follow the directions in "Loading the Software" on page 14, steps 5 through 9 for building the **startgateway** command. In step 9, the existing **startgateway** command displays and you are asked if you want to replace it with the new one. Then continue with steps 13 and 14 to start the service.

Option 3 (Install the media and build the startgateway command.) enables you to perform the functions of both options 1 and 2.

Follow the directions in "Loading the Software" on page 14, steps 4 through 14 for doing so. In step 9, the existing **startgateway** command displays and you are asked if you want to replace it with the new one.

7. Remove the CD-ROM from the CD-ROM drive.

Setting Configuration Parameters

If the gateway is to support more than 15 simultaneous sessions, you might need to change the value of certain system variables. These system variables are listed in Table 1.

Table 1. HP-UX system variables affected by the number of gateway users

Variable	Recommended values
maxuprc	Maximum number of user processes. Set this variable to a value of 200.
msgmni	Number of message-queue identifiers. Set this variable to a value of 150.
semmni	Number of semaphore identifiers. Set this variable to a value of 150.

To use SAM to change the value of these variables:

1. While logged in to the UNIX interface as the root user, type the **sam** command.

   The Main menu appears.

2. Select **Kernel Configuration**.

   The Kernel Configuration menu appears.

3. Select **Configurable Parameters**.

   The Configurable Parameters table appears.

4. Modify the parameters as necessary.
5. Create a new kernel and reboot the system.

When your installation is complete, go to Chapter 5, “Performing Configuration and Administration Tasks” on page 27, for how to configure a database gateway service from a UNIX-based workstation.

To configure and administer the database gateway services by means of using the asset management and database gateway interfaces, see *Configuring and Administering Database Gateway Services*. For other system and database administration tasks, see the *System Administration Guide and Reference* and *Administering Databases with IDS*.

Chapter 4. Installing a Service on a SPARCstation Workstation

IDS database gateway services for UNIX environments can run on a Sun SPARCstation workstation connected to an IDS Ethernet LAN.

This chapter provides the software requirements, the installation instructions, and the upgrade instructions to run the database gateway services on a SPARCstation workstation.

Hardware and Software Requirements

This section identifies the hardware and software requirements for running the IDS database gateway services on a SPARCstation workstation. See the README file on the IDS UNIX Database Gateway CD-ROM for the latest information about supported versions.

Hardware

The hardware requirements to run gateways with a Sun SPARCstation 10, Model 514 workstation for a UNIX environment are:

A minimum of 32 MB of internal memory on your workstation.

A minimum of 12 MB free disk space for the user's home directory on the UNIX-based workstation. This space must be independent of the space needed for the RDBMS server.

For TCP/IP networks, an Ethernet or token-ring network adapter.

A CD-ROM drive.

Software

To perform this installation, you must have:

IDS version 1

One or more of the following servers:

- SYBASE SQL Server, versions 4.x or 10.x.
- ORACLE server for HP-UX, version 6 or 7.

  If the ORACLE server and the database gateway service are going to be installed on separate workstations, you must have Oracle SQL*Net product on the ORACLE server. Although SQL*Net is linked in the IDS database gateway services, you must obtain the right to use it before you can use the service.

SPARCstation database gateway services software.

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Installing the Gateway Service

In general, installing the gateway software consists of:

Creating the gateway service user account

Loading software from the IDS UNIX Database Gateway CD-ROM

These tasks are performed at the SPARCstation workstation. Each task is described in greater detail in the following sections. Before proceeding, determine the type of IDS network you are using (such as Ethernet or token ring).

The user ID *idsgw* and home directory */u/idsgw* are used in the examples in this document.

Creating the Gateway Service User Account

User accounts can be created for any user ID and home directory. You must create a user ID that is to be used exclusively for the database gateway service.

To create a database gateway service user account on a SPARCstation workstation:

1. Log on as root.
2. Verify the amount of free space in the /u file system by entering:

   ```
   df /u
   ```

   The df command displays the number of free 512-byte blocks. 6000 free blocks are needed.

   User accounts require a minimum of 12 MB free disk space in the home directory.
3. Create a gateway service user account. This is typically accomplished with the **useradd** command. Do not define a gateway user's home directory under any other gateway user's home directory.
4. Ensure that the PATH= statement in the gateway user's .profile file includes access to the current directory (**.**), the */usr/ucb* directory, and the */usr/bin* directory.

   For example, your PATH= statement might resemble the following statement.

   ```
   PATH=/etc:/usr/etc:/bin;/usr/bin:/usr/ucb:.
   ```

   The /usr/bin path name must be placed before the */usr/ucb* path name. You can then use certain commands, such as *whoami*, *uname*, and *ps*.
5. Log off.

Loading the Software

To install the database gateway service on a SPARCstation workstation:

1. Insert the CD-ROM.
   a. Ensure that the CD-ROM is mounted.
   b. If it is not mounted:
      1) Enter:

         -mount -rv cdrfs /dev/cd <CD-ROM directory>

      2) Log off.
2. Log on to the workstation as the gateway service user (*idsgw*, in these examples).
3. Load the gateway service software by executing the installation script by typing:

   <CD-ROM directory>/solaris/instids

   The installation script creates a subdirectory named *bin* into which it loads the gateway software.
4. Press Enter when the system directs you to.
5. Press Enter if the gateway service is attached to le0. If it is not, type the correct network device interface name and press Enter.
6. Press Enter to accept the default realm number (1) or enter a different realm number and press Enter.
7. If this is the only database gateway service installed in this SPARCstation workstation, accept the default UNIX IPC shared memory key offset (47) by pressing Enter.

   If you are going to install more than one database gateway service on the workstation, type a different offset number between 1 and 99 for each subsequent gateway service. Key offsets must be unique among multiple active gateway services.

   After accepting the default type or entering the offset number, the system will ask if this is a routable gateway.
8. Enter **n** if this is not a routable gateway.

   The system then creates the **startgateway** command. Skip step 9 and continue with the procedure. For more information about the instids script, see the paragraphs following step 9.

   Enter **y** if this is a routable gateway.

   The system prompts you for the IP addresses of the Asset Manager and the Directory Service.
9. Press Enter to accept the defaults. Otherwise, enter the IP addresses.

   The system creates the **startgateway** command.

The instids script assigns the values you specified in the installation script (such as the network type and the realm number) to the environment variables within the **startgateway** command.

Environment variables are automatically set during the installation process, based on information you supply. See Appendix A, “IDS Environmental Variables” on page 31 for a list of environmental variables.

10. After the install script finishes loading the files, verify that they are in the bin directory by entering:

    ```
    cd bin (if not already in the bin directory)
    ls
    ```

    You should see:

    ```
    M4CALIST
    M4CAMAIN
    M4CARECV
    M4CASEND
    M4CONSOLE
    M4CORE
    M4DBGW
    M4DBORA
    M4DBSERV
    M4DBSESS
    M4DSP
    M4S411
    M4S411SVR
    M4SPPREX
    M4XNS
    M4startup
    README
    abortgateway
    rmipc
    showgateway
    startgateway
    stopgateway
    ```

    If any files are missing, contact the IBM Support Center.

11. After you have completed the installation, remove the CD-ROM from the CD-ROM drive.

12. Change the ownership and mode of the M4S411SVR file after obtaining permission from your system administrator.

    To change ownership and mode of the M4S411SVR:

    ```
    % cd bin (if not already in the bin directory)
    % su
    % password: (enter the root password)
    % chown root M4S411SVR
    % chmod 4711 M4S411SVR
    % exit
    ```

13. Configure the node and assign it a Database Gateway Service using the Asset Management interface within the SA Tool. These tasks are described in detail in *Configuring and Administering Database Gateway Services*.
14. Now you can start the service by typing:

    cd bin (if not already in the bin directory)

    ./startgateway

    For detailed information on administration on the UNIX Interface, see Chapter 5, "Performing Configuration and Administration Tasks" on page 27.
15. After the service has started, you must configure and administer the gateway using the Database Gateway Service interface within the SA Tool. These tasks are described in detail in *Configuring and Administering Database Gateway Services*.

Upgrading the Gateway Service

To upgrade the gateway service, load the new version of software from the IDS UNIX Database Gateway CD-ROM:

1. Log on to the workstation as the gateway service user (*idsgw*, in this example) and stop the gateway service as follows:

   cd bin (if not already in the bin directory)
   ./abortgateway
2. If you are going to build the **startgateway** command only, proceed to step 5.
3. If you are going to install a gateway from the CD-ROM, first remove the M4S411VR file. Obtain permission from your system administrator before doing so.

   To remove the M4S411VR file:

   % cd bin(if not already in the bin directory)
   % su
   % password: (enter the root password)
   % rm M4S411SVR
   % exit
4. Insert the CD-ROM into the CD-ROM drive.
   a. Ensure that the CD-ROM is mounted.
   b. If it is not mounted:
      1) Enter:

         -mount -rv cdrfs /dev/cd <CD-ROM directory>
      2) Log off.
5. Load the gateway software by executing the installation script. Enter:

   <cdrom directory>/solaris/instids

   The installation script detects whether a subdirectory named *bin* already exists and whether gateway software has already been loaded from a previous release. It then prompts you with four options:

1. Install the media only.
2. Build the startgateway command only.
3. Install the media and build the startgateway command.
x. Exit the install script.

a. **Option 1 (Install the media only.)** enables you to install the media and overwrite the existing files. You will not be asked for information to build the **startgateway** command.

   Follow step 4 in "Loading the Software" on page 22. Verify that the files were loaded correctly by following step 10, then proceed with steps 11 through 15 to set permissions and start the service.

b. **Option 2 (Build the startgateway command only.)** prompts you for information that is used to build the **startgateway** command.

   Follow steps 5 through 9 in "Loading the Software" on page 22. In step 9, the existing **startgateway** command appears and you are asked if you want to replace it with the new one. Then continue with steps 13 and 14 to start the service.

c. **Option 3 (Install the media and build the startgateway command.)** enables you to perform the functions of selections 1 and 2 combined.

   Follow steps 4 through 14 in "Loading the Software" on page 22. In step 9, the existing **startgateway** command appears and you are asked if you want to replace it with the new one.

6. Remove the CD-ROM from the CD-ROM drive.

Setting Configuration Parameters

The Solaris operating system variables contained in the /etc/system file should be set to the values listed in Table 2 on page 26.

Table 2. Solaris system variables

Variable	Recommended values
maxusers	Maximum number of active users on the system. Set this variable to a value of 32 or more.
shmmax	Maximum shared memory segment size. Set this variable to a value of 5000000.
shmmni	Number of shared memory identifiers. Set this variable to a value of 100.
shmseg	Number of segments per process. Set this variable to a value of 16.
semmni	Number of shared semaphore identifiers. Set this variable to a value of 300.
semmns	Number of semaphores in the system. Set this variable to a value of 500.
msgmni	Number of message-queue identifiers. Set this variable to a value of 150.

After you have set these variables, the information in the /etc/system file should look similar to what follows.

```
set maxusers=32
set shmsys:shminfo_shmmax=5
set
shmsys:shminfo_shmmni=1
set shmsys:shminfo_shmseg=16
set
semsys:shminfo_semmni=3
set semsys:shminfo_semmns=5
set
msgsys:shminfo_msgmni=15
```

You must reboot your system to activate these changes.

When your installation is complete, go to Chapter 5, “Performing Configuration and Administration Tasks” on page 27, for how to configure the database gateway service from a UNIX-based workstation.

To configure and administer the database gateway services by means of using the asset management and database gateway interfaces, see *Configuring and Administering Database Gateway Services*. For other system and database administration tasks, see the *System Administration Guide and Reference* and *Administering Databases with IDS*.

Chapter 5. Performing Configuration and Administration Tasks

After installing the IDS database gateway services, you must perform some administration tasks to ensure proper operation of your gateway service.

This chapter describes the configuration tasks you must perform at your UNIX interface or developer's desktop for your database gateway service. Some troubleshooting information is also included.

To configure the database gateway service for IDS, see *Configuring and Administering Database Gateway Services*.

Starting the Service

After the gateway is loaded, you can use the **startgateway** command to start the gateway and verify the service connection, regardless of whether IDS is configured.

To execute the script:

1. Log on to the UNIX interface as the gateway service user (*idsgw*, in these examples).
2. To start the gateway, enter:

   cd bin (if not already in the directory)

   startgateway

   When you start the gateway, the program verifies that the environment variables are set.

If the database gateway is having a problem starting up, the workstation will either hang or display a series of error messages after the last line of the previous display.

If a problem occurs, use the **abortgateway** command to stop the gateway. Then fix the problem and reissue a **startgateway** command. These commands and other administration commands are described in the next section. See the section, “Troubleshooting” on page 29, for possible reasons for the failure.

After the gateway service completes its startup routine, it does not attempt to connect to the database server until some action on IDS makes a connection necessary. Such an action might be a user performing a query on the data on the server. Depending on the reason for the original failure and the status of the database server, the second connection attempt might succeed where the first one failed.

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Gateway Administration Commands

You can issue the commands listed and described in Table 3 at the UNIX interface to administer the gateway service.

Table 3. UNIX gateway administration commands

Command	Description
startgateway	Starts the gateway. A banner appears on the interface if the command is successful. If the banner does not appear, or if an error message is received, an error has occurred.
stopgateway	Stops the gateway service.
showgateway	Displays the status of the running gateway service process (similar to the UNIX ps command).
abortgateway	Terminates the gateway service in case certain errors leave it in an inconsistent state, where it cannot be stopped or started. For example, if you issue a stopgateway command and a subsequent startgateway command immediately fails with a system error, issue the abortgateway command.

Attention: The abortgateway and stopgateway commands remove any operating system message queues, semaphores, and shared memory owned by the user ID issuing the command.

Securing Your Database Gateways

As the administrator of a common realm that users on other realms and networks are linked to, you can encounter security problems when those users access your database gateways.

To avoid such conflicts, IBM offers the SecureNet feature which allows you to restrict access to some or all of the database gateways on your realm.

To implement this feature, you must create one or more SecureNet *node* Network Access documents in the Network Info file drawer, where *node* is the name of the node on which the gateway service is installed. These documents specify the networks that will be able to access the gateway service.

If a network that is not listed on a document attempts to communicate with one of the gateway services on the specified node, its request is ignored.

If you implement SecureNet for a node on which a database gateway service is installed, you will be restricting access to every other service on that node as well.

A *node* Network Access document applies only to gateway services running in UNIX environments. If the *node* Network Access document does not exist, then the Network Access document will be used (if it exists). If neither documents exist, then SecureNet is not used.

For more details about the SecureNet feature, see the information on Internetwork Security in the *System Administration Guide and Reference*.

Troubleshooting

The most common problem that occurs after issuing the **startgateway** command is that the IDS gateway does not start up.

The possible sources of this problem might be:

The IDS primary file server is not properly configured to support the gateway. Verify that the proper Ethernet or token-ring address was specified during configuration and that the limits summary document indicates the correct capability class for the gateway.

The network cable connections might be loose or improperly seated. Verify that the connections are secure.

The gateway is not on the same LAN as the IDS primary file server. The gateway sends a broadcast message that the primary file server must receive. Until it receives a reply to this message, the gateway hangs. Be sure the gateway and primary file server are on the same LAN. If they are on a bridged token-ring LAN, ensure that the broadcast message from the gateway crosses bridges to the file server.

The token-ring adapter is configured to run at the wrong speed. Ensure that the ring speed matches the speed of your token-ring network.

This situation points to an installation problem. Execute the **abortgateway** command to halt the process.

Error Messages and Explanations

The following list details some common error messages, their possible causes, and their possible solutions:

Failed to create shared memory segment: Invalid argument This error indicates that there are some UNIX-shared processes left over from a previous run of the gateway. Execute the **abortgateway** command to halt the process.

Error in sysgetmsgmaybe rc=-2 This error also might indicate that there are some UNIX-shared processes left over from a previous run of the gateway. Execute the **abortgateway** command to halt the process.

After you issue the **startgateway** command:

error: open failed: errno=2

The network adapter cable might not being plugged into the network adapter card. Press Enter to display the prompt, then execute the **abortgateway** command to reset the gateway.

Service Name: *xxx* **- not displayed** where *xxx* is the name of the service. This message appears when the service has not been configured for this node. To correct this problem, access the Asset Management interface within the SA Tool and configure the service for the node.

Gateway Name: *xxx* **- not displayed** where *xxx* is the name of the gateway. This message appears when the gateway has not been configured for this node. To correct this problem, access the Database Gateway Services interface within the SA Tool and configure the gateways for the services on the node.

Establishing Gateway and Session Logging

One of the advantages of the database gateway services is the ability to create logs at either the gateway or session level. To use the logging feature, set the M4SQLLOG environment variable before starting the service. You do this by issuing the **startgateway** command.

Important: Enabling the logging feature will affect your system's performance. You should not use the logging feature without recommendation from the IBM Support Center.

To set the M4SQLLOG variable, enter one of the following commands, depending on the type of shell you are using:

If you are using sh, type:

```
M4SQLLOG=1; export M4SQLLOG
```

If you are using csh, type:

```
setenv M4SQLLOG 1
```

You can also modify the **startgateway** command by inserting the following line before the echo ' ' line.

```
M4SQLLOG=1; export M4SQLLOG
```

After this variable is set, logging is turned on (by default) for each session. You can enable and disable the logging feature from the Database Gateway Services menu.

All logging information, particularly the SQL statements, will be written into the m4sql.log file.

See *Configuring and Administering Database Gateway Services* for more information about the gateway and session levels, and the logging feature.

Appendix A. IDS Environmental Variables

The following table lists the IDS environmental variables.

Table 4. IDS environment variables

Environment variable	Description
M4GW_PROTOCOL	Identifies the network protocol of the IDS network.
M4GW_NETDEV	Indicates the device name of the network adapter used by the database gateway service to access an IDS network. In the AIX environment for an Ethernet adapter, this device name is typically en0 for tcp/ip.
M4GW_REALM	Indicates the IDS LAN realm number.
M4GW_OFFSET	Is used only when you are running more than one database gateway service in a RISC System/6000 workstation. Refer to the section, "Running Multiple Services on a Workstation", for the instructions about running multiple gateway services on one workstation.
M4GW_AMADDR	Indicates the IDS LAN asset manager IP address for routable gateways.
M4GW_DSADDR	Indicates the IDS LAN directory service IP address for routable gateways.
CADEBUGLEVEL	Indicates the debug level for the console agent. If a value other than 0 is specified, then a log is created with debugging information. The default is *0*.

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Glossary

asset management. Identification and distribution of purchased IDS features, services, and tools licensed for use.

client. A program that requests a service from another program.

conversation. In Systems Network Architecture (SNA) communications, a connection between two APPC transaction programs (TPs) over an LU-LU session that allows them to communicate with each other.

Ethernet. A type of local area network used for IDS connections. An Ethernet network uses a bus topology (that is, all devices are connected to a single cable). An Ethernet network can include any of several kinds of physical transmission media.

file service. In IDS, a software process that manages disk storage of the system software and user data.

file server. The computer on which the file service runs.

gateway. A software component that establishes a communications path between a workstation and a relational database.

gateway service. A software process that translates protocols and access methods between two dissimilar systems.

gateway service identifier. A unique 3-character string, such as *GWA* or *GWB*, that identifies a gateway service as used in various configuration parameters.

gateway service name. The name by which a gateway is known to other components on the LAN.

LAN. Local Area Network.

link. In communications networks, a serial-by-bit connection under the control of Synchronous Data Link Control (SDLC).

load balancing. A feature that permits the service to distribute user sessions automatically across individual gateways grouped into a pool. With load balancing, the service assigns a user session to the least-loaded gateway in the pool, making maximum use of load capacity.

local area network (LAN). A data communications network, spanning a limited geographical area, in which serial transmission is used for direct communication among workstations or other devices.

local network. The network to which a specified user or resource is directly connected.

logical database. A database representation that includes print names for tables and columns, and that groups the tables into useful categories. The logical database also contains definitions for default joins between tables. The Workstation Tools Data Dictionary (WTDD) stores the description of the logical database, the mapping of print names to internal names in the physical database, and other logical attributes, such as the type and length of data.

network. A set of workstations, servers, and other devices connected together for the interchange of information.

parameter. Data passed by a user to a program in order to direct or limit processing.

pool. A collection of similar gateways or services that accesses a single database or host. Based on current loads of the individual gateway service, the service dynamically assigns database-access requests to pool members.

protocol. A set of rules and conventions that governs how two entities exchange data.

realm. In IDS networks, a collection of IDS resources that is maintained as a logical group (that is, a group that is determined not by physical boundaries, but rather by virtue of being associated with one another). A realm must contain a Primary File Service and a Directory Service. Other components such as workstations, Internetwork Routing Service, and Data Access Services can be added to form a functional IDS local area network (LAN).

relational data. In a relational database, information that is related to other information and whose relationships can be defined in the form of tables consisting of rows and columns of data.

relational database. A database that is organized and accessed according to relationships between data items. These relationships are expressed as tables related by

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data values, rather than by pointers or memory locations.

relational database management system (RDBMS). The software that makes it possible to create, use, and maintain relational data in the form of tables consisting of rows and columns of data.

remote network. A network other than the local network, but which is accessible to the local network.

serial transmission. The sequential transmission of data, one bit at a time.

server. The computer in which a service runs.

service. A software process that provides facilities to other parts of IDS, such as a file service, a mail service, a mail gateway service, and a database gateway service.

session. In the OS/2 environment, one instance of a running program or command prompt. IDS runs in an OS/2 full-screen session.

SQL (Structured Query Language). A command language used with relational databases. The language consists of statements to insert, update, delete, query, and protect data. IDS tools use SQL to communicate with database servers.

token-ring network. A network that uses a ring topology, in which tokens are passed in a circuit from node to node. A node that is ready to send can capture the token and insert data for transmission.

view. A copy of a query, which can be named, stored, edited, and redisplayed for later use.

Workstation Tools Data Dictionary (WTDD). A logical data dictionary that standardizes the IDS workstation view of data across many relational database management systems. The WTDD stores the print names of database items, defines how the items are to be displayed, and includes other logical attributes of data. The WTDD is implemented as a set of standard relational tables that can be managed through the DBA tool.

IDS Publications

This section lists IDS publications, including order numbers. To order copies of the books listed here, or to get more information about a book, see your IBM representative.

General Publications

Getting Started with the Intelligent Decision Server (SC26-8892)

Working with the Intelligent Decision Server (SC26-8893)

Installation, Configuration, and Administration Publications

Installing IDS LAN Components (GC26-8877)

System Administration Guide and Reference (SC26-8890)

Messages and Codes (GC26-8878)

Database Gateway Services Publications

Installing Database Gateway Services for UNIX Environments (GC26-8884)

Configuring and Administering Database Gateway Services (GC26-8885)

Administering Databases with IDS (SC26-8891)

Host Services Publications

Planning MVS Host-to-LAN Connectivity (GC26-8880)

Installing Host Services and Configuring Host-to-LAN Communications for MVS (GC26-8881)

Administering Host Services for MVS: DB2 and Cooperative Application Services (GC26-8882)

Developing Applications with Cooperative Application Services (GC26-8883)

Configuring and Administering Mail Gateway Services (GC26-8923)

Open Data Access Service Publications

Developing Applications with Open Data Access Service (SC26-8888)

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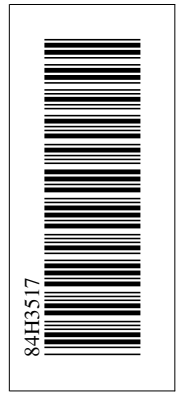

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